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HIGH PRIORITIES

GEF's Contribution to Preserving and Sustaining Mountain Ecosystems

Global Environment Facility

The Global Environment Facility collaborates with developing countries and countries with economies in transition in four regions of the world to conserve and support sustainable development in mountain environments. The report describes GEF projects on mountain biodiversity, water, and landscapes and how these projects assist mountain people in sustainably enhancing their quality of life. Readers will also gain an understanding of how GEF and its three implementing agencies—the United Nations Development Programme, the United Nations Environment Programme, and the World Bank—work with countries to ensure that the GEF project development process is driven by countries and reflects their national development priorities. A list of GEF projects relating to mountain environments appears at the end.

HIGH PRIORITIES

GEF's contribution to conserving and sustaining mountain ecosystems

WHAT IS GEF?

The Global Environment Facility is a major catalyst for improving the global environment. Following a three-year pilot phase, GEF was formally launched in 1994 to forge cooperation and finance actions addressing four critical threats: biodiversity loss, climate change, degradation of international waters, and ozone depletion.

During its first decade, GEF allocated $4 billion, supplemented by more than $12 billion in cofinancing, for more than 1,000 projects in 160 developing countries and countries with transitional economies.

GEF is the designated financial mechanism for international agreements on biodiversity, climate change, and persistent organic pollutants (POPs). GEF also supports the work of the global agreements to combat desertification and protect international waters and the ozone layer.

GEF projects are carried out by public and private partners. The United Nations Development Programme (UNDP), the United Nations Environment Programme (UNEP), and the World Bank have managed GEF projects in their capacity as implementing agencies since 1991. In 1999 the GEF Council expanded opportunities for seven other agencies to work on GEF projects. Today, the Food and Agricultural Organization of the United Nations (FAO), the United Nations Industrial Development Organization (UNIDO), the African Development Bank (AfDB), the Asian Development Bank (ADB), the European Bank for Reconstruction and Development (EBRD), the Inter-American Development Bank (IDB), and the International Fund for Agricultural Development (IFAD) execute GEF projects under this policy.

GEF counts 173 countries as members and is unique among international financial organizations in welcoming the participation of representatives of nongovernmental organizations in its deliberations.

A recent independent assessment of GEF's performance found that it has "produced significant results" for global environmental protection and sustainable development over the past decade.

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MOUNTAINS MATTER

The 2002 World Summit on Sustainable Development (WSSD) in Johannesburg, South Africa, renewed international commitment to actions that protect the global environment while creating sustainable development opportunities in local communities. The summit called for, among other goals, improved access to clean water, sanitation, and energy, increased protection of biodiversity, and reduced degradation of natural resources. All this was premised on the critical need to improve the livelihoods of the more than one billon people who live on less than a dollar a day.

The action plan that came from WSSD clearly recognizes the importance of protecting and managing mountains as a critical part of the natural resource base for economic and social development. Mountains supply half the world's freshwater and harbor remarkable concentrations of biological diversity. Their landscapes support one in ten people on earth and provide essential ecological services for those living in lowlands. Worldwide, many of the most impoverished people live in mountainous regions; efforts to help mountain people develop sustainable livelihoods within their fragile environment directly address poverty in these regions.

Over the past decade, GEF has become one the largest funders—and a catalyst in leveraging additional financial support—of projects to conserve mountain biodiversity.

Specifically, the WSSD action plan calls for research, programs, policies, and approaches that "integrate environmental, economic, and social components of sustainable mountain development." This includes programs that address deforestation, erosion, land degradation, loss of biodiversity, disruption of water flows, and glacial retreat. It also includes working with mountain people to promote the best from traditional mountain livelihoods, introduce new sustainable and gender-sensitive approaches, build capacity, and provide adequate financial and technical assistance.

It will take many hands to implement this ambitious agenda, and partnership was a major theme at the summit. GEF is proud to be working with governments, NGOs, private companies, communities, and individuals to conserve and develop mountainous areas sustainably. Over the past decade, GEF has become the largest funder—and a catalyst in leveraging additional financial support—of projects to conserve mountain biodiversity.

Just prior to the World Summit on Sustainable Development, donor nations cast an extraordinary vote of confidence by replenishing GEF's trust fund by nearly $3 billion—the largest amount ever. Backed by this robust international commitment, GEF is now poised to expand and improve its support to the global environment. This will include, to a substantial degree, projects that conserve and develop sustainably the world's highly important mountain regions. GEF's new strategic priorities, described herein, will help target its projects to this long-term goal. We look forward to working with you on this critical task.

Mohamed T. El-Ashry
CEO and Chairman
Global Environment Facility

SAFEGUARDING MOUNTAIN ENVIRONMENTS

FOR AGES, MOUNTAINS HAVE HELD A SPECIAL SIGNIFICANCE FOR PEOPLE. MANY RELIGIONS HAVE REVERED MOUNTAINS AS HOLY PLACES, AND POETS, ARTISTS, AND MUSICIANS HAVE SOUGHT THEM OUT FOR INSPIRATION.

Many religions have revered mountains as holy places, and poets, artists, and musicians have sought them out for inspiration. Mountains have been sources of beauty and enjoyment for everyone from the casual tourist to the mountaineer seeking adventure. More concretely, highlanders and lowlanders alike have depended on mountain water for drinking, farming, and industry. People also depend on mountain flora and fauna for food and as sources of genetic diversity for crops.

There is no scarcity of mountainous areas on earth, which cover more than a quarter of total land surface and are found on every continent from the equator nearly to the poles. Mountains occur in a range of climates—from humid coasts to dry interiors—and host varying collections of ecosystems; yet, all mountains share distinct characteristics that make them at once highly biologically diverse, ecologically fragile, and worthy of our attention:

- Biodiversity. The different altitudes and varied topography have made wild habitats on mountains vastly more complex. Elevation, slope, and orientation to the sun greatly influence temperature, wind, moisture levels, and soil makeup across short distances. This variety of conditions creates a patchwork of microclimates and habitats that encourages diversity in plant and animal life. Some habitats have been sufficiently isolated over long periods to become islands of plant and animal endemism.
- Water. Mountains receive the bulk of precipitation around the world and store it in different forms such as snow and glaciers. These vast reservoirs contain half of the earth's fresh surface water. When the water is released, it provides more than half of the freshwater used by people—supporting communities, agriculture, fisheries, and industry far beyond the mountains' geographic limits.
- Landscapes. The verticality of mountains makes their surfaces highly unstable. Soils—often young, shallow, and poorly anchored—erode more easily than in lowlands. Mountain slopes are more subject to landslides, avalanches, lava flows, earthquakes, torrents, and rock falls. Soils, and the flora and fauna they support, recover slowly from any kind of disturbance, be it natural or human caused. Nonetheless, mountainous areas are key productive landscapes for people and could support agriculture, forestry, and other economic activities long into the future if managed sustainably.

WHAT MAKES A MOUNTAIN?

ALTHOUGH DEFINITIONS OF MOUNTAINS VARY, ONE RULE OF THUMB IS LAND AREAS THAT ARE HIGHER THAN 1,000 METERS ABOVE SEA LEVEL. UNDER THIS DEFINITION, MOUNTAINOUS AREAS COMPRISE 27 PERCENT OF THE EARTH'S LAND SURFACE.

Mountains and People

Mountains have long supplied their bounty to human communities. Valued since prehistoric times for their concentrated plant and animal diversity, year-round water, wood, shelter, and defensive advantages, mountains are now home to one in ten people. Mountains still harbor many indigenous cultures with unique traditions, knowledge, and livelihoods.

- **Six of the twenty crops that now supply 80 percent of the world's food—among them the potato, corn, and sorghum—originated in mountain ecosystems.**

- **Nearly 3 billion people depend on mountains for hydroelectricity, timber, and mineral resources.**

In recent years, however, human activities have had an increasing toll on mountain environments. Population growth (which, for example, in most Andean and Himalayan regions has doubled in the past few decades) is increasingly isolating mountain environments as "vertical ecological islands" of nature in a sea of densely populated lowlands. Other stresses include pollution, invasive alien species, extractive industries, war and conflicts, and unsustainable tourism. Mountains are also vulnerable to the impacts of climate change, which in some places has visibly affected the rate of glacial melt and water supplies downstream, threatening the wild species that will not be able to adapt quickly enough.

- **During the 1990s, mountain forests suffered greater loss than any type of lowland forest.**

GEF Investments in Mountains

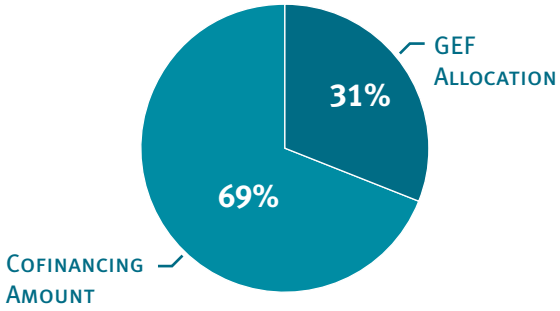
Mountain environments, home to some of the poorest communities in the world, clearly warrant special attention and integrated research programs for conservation and sustainable development. Since its inception, GEF's work on the global problems of biodiversity loss, degradation of international waters and land, climate change, ozone depletion, and persistent organic pollutants has benefited mountain environments. These represent multiple areas of strength to improve the quality of life of mountain communities while protecting the global environment.

- **About 40 percent of GEF projects in mountain ecosystems are in Latin America and the Caribbean; 30 percent are in Asia.**

- **By July 2002 GEF had committed more than $620 million and leveraged additional funding of about $1.40 billion for a total of $2.02 billion in support of at least 107 mountain-related projects in 64 nations.**

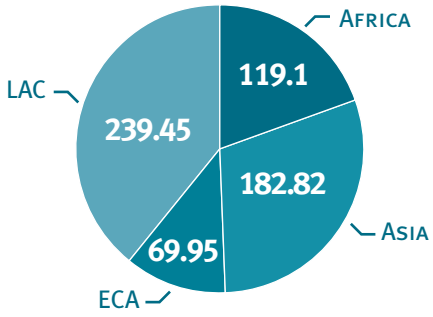
THE LEVERAGING EFFECT OF GEF SUPPORT FOR MOUNTAIN PROJECTS 1991-2002

(TOTAL = US$2.02 BILLION)



TOTAL GEF ALLOCATION BY REGION FOR MOUNTAIN PROJECTS 1991-2002

(In millions of US dollars, excluding global and multiregional projects)



PROTECTING MOUNTAIN BIODIVERSITY

MOUNTAINS ARE A VAST STOREHOUSE OF BIOLOGICAL DIVERSITY, IN ALL ITS DIMENSIONS.

For example, mountains shelter half of the 90,000 species of higher plants in the Neotropics alone. The Himalayas harbor more than 25,000 plant species. Small patches of mountain cloud forest are home to such remarkable species as the mountain gorilla in central East Africa, the spectacled bear in the Andes, and the resplendent quetzal in Central America. The eastern slopes of the Andes may hold the highest levels of biodiversity in the world. On all mountains, levels of endemism—that is, species found nowhere else in the world—are remarkably high because of the heterogeneity of mountain landscapes and ecosystems.

Some scientists believe that mountains have served as evolutionary "refuges" for species during periods of climatic change. Mountains have recently begun serving as refuges for the many species that have disappeared in the populated lowlands. Many of these offer genetic diversity of great use to people. For example, the Mexican mountain Sierra de Manantlan is home to the only known stands of a primitive wild relative of corn. Nepalese mountain farmers grow 2,000 varieties of rice, and Andean farmers 200 varieties of indigenous potatoes. Mountain communities often have considerable knowledge of the potential of local species. This knowledge, as well as the species themselves, is now threatened.

- **Mountains shelter half of the 90,000 species of higher plants in the Neotropics alone.**
- **One third of designated protected areas worldwide are mountainous areas.**

In many respects, mountains are among the world's most vulnerable biogeographical domains. Plants and animals are highly adapted to harsh conditions and to specific microclimates. Slight changes in conditions can diminish a species' chances of survival. Sustainable uses of mountain environments have in

WHAT IS BIODIVERSITY?

According to the Convention on Biological Diversity, biological diversity or biodiversity represents the variability among living organisms from all sources, including terrestrial ecosystems, marine and other aquatic ecosystems, and ecosystems of which they are a part. Variability refers to diversity within species, among species, and of ecosystems. Ecosystems are dynamic complexes of plant, animal, and microorganism communities and their nonliving environment interacting as a functional unit.

GEF AND THE CONVENTION ON BIOLOGICAL DIVERSITY

The Convention on Biological Diversity (CBD) is the first global agreement on the conservation and sustainable use of biological diversity. More than 184 countries have ratified the agreement since it was launched 10 years ago.

GEF was designated as "the institutional structure entrusted with operation of the financial mechanism of the CBD" to assist developing countries in meeting convention objectives. The convention's Conference of Parties (COP) guides GEF on the policies, program priorities, and eligibility criteria to be applied for this purpose. GEF has been a leading force in facilitating the conservation and sustainable use of mountain ecosystems for global environmental benefit in response to the guidance of the Conference of the Parties.

The COP has initiated work in five key areas, addressing marine and coastal biodiversity, agricultural biodiversity, forest biodiversity, the biodiversity of inland waters, and dry and subhumid lands. At the COP meeting in 2004, mountain biodiversity will be one of the priority themes.

the past respected subtle ecological differences among habitats. For example, farmers in Rwanda sow six to thirty varieties of beans that thrive at different elevations and in different climatic and soil conditions.

Greatly expanded human use of mountain environments, however, has increased the pressures on biodiversity and problems in its conservation and sustainable use. These threats now include population growth, unsustainable farming practices, overharvesting of wild species, tourism, pollution, invasive alien species, extractive industries, war and conflicts, and even climate change.

GEF's Contributions to Conserving Mountain Biodiversity

For the past decade, conservation of the earth's remaining biological diversity has been one of GEF's highest priorities. GEF supports practical measures to encourage sustainable uses of plants and animals—particularly by people who depend on natural resources for their livelihoods—and stakeholder involvement, while promoting awareness of biodiversity's value. GEF brings together key institutions and individuals, catalyzing action and ensuring that funding meets country priorities as well as the needs of local communities.

Based on guidance provided by the Convention on Biological Diversity, GEF has focused on mountain biodiversity as one of four types of critical life-supporting systems—which also include drylands, coastal/marine/freshwater areas, and forests—and the interactions among them. GEF projects establish sustainable land-use practices on mountain slopes to protect characteristic habitats and strengthen the network of representative conservation areas in alpine, mountain grassland, montane forest, and freshwater ecosystems. GEF projects help promote two objectives in environmentally vulnerable mountain areas:

- Conservation or *in situ* protection of biodiversity, particularly by protecting systems of conservation areas
- Sustainable use of biodiversity through wise use of mountain ecosystems, combining productive, socioeconomic, and conservation goals. This can include strict protection in reserves, multiple use with conservation easements, or full-scale use.

Typical activities supported by GEF projects in mountainous regions include:

- Establishment and management of key protected areas

- Conservation and sustainable use of biological resources in rural landscapes
- Knowledge generation as a basis for sound decision making, monitoring, and assessment
- Integration of biodiversity conservation into main productive economic sectors, such as forestry.

GEF has supported 107 projects in globally significant mountain ecosystems. Most of them have focused largely on protected areas and surrounding areas. In addition, at least 87 projects are in globally significant sites including World Natural and Cultural Heritage Sites, the Global 200 list, and UNESCO-Man and the Biosphere, among others.

GEF projects for mountain biodiversity range widely around the globe—including such notable mountain ranges as the Andean in South America, Carpathian in Europe, Drakensberg in Africa, and Himalayan in Asia. The following provides a sampling of GEF's extensive portfolio of mountain biodiversity projects:

Africa

GEF supports diverse projects to protect biodiversity in Africa's mountainous regions, including environmental trust funds to assure long-term financing for biodiversity conservation. Most projects help protect species important to people's livelihoods, health, or culture.

Uganda. GEF has pioneered development of environmental trust funds as a financial mechanism for providing long-term funding for forest protection in Africa and elsewhere. One GEF project in Africa, managed by the World Bank, created trust funds to help conserve and sustainably develop the Bwindi Impenetrable and Mgahinga Gorilla national parks in Uganda, among other activities, by encouraging sustainable sources of income for local communities, including ecotourism.

Ethiopia. The wide diversity of medicinal plants found in Bale Mountains National Park and nearby Harenna Forest in Ethiopia is increasingly threatened by agricultural expansion, deforestation, and overharvesting. A GEF project managed by the World Bank is supporting farmer-based cultivation trials of selected threatened and indigenous species in home gardens. Elders—mostly women who have used herbal remedies in home health care—provided the best advice in identifying and conserving medicinal plants. That advice will be used by youth groups that were formed to cultivate medicinal plant gardens along the boundaries of villages and to market herbal remedies outside the villages.

Asia and the Pacific

In the past decade, GEF has supported establishment and protection of systems of conservation areas in, among other areas, Himalayan regions and montane areas of the Indochina peninsula. GEF has also supported government efforts to encourage the wise use of mountain ecosystems. These efforts are intended to achieve productive, socioeconomic, and conservation goals—full-scale use of biological resources in some areas, various forms of multiple use with conservation easements in other areas, and strict protection of biological reserves.

Bhutan. The small country of Bhutan holds relatively pristine forest and rich biodiversity. A GEF project, managed by the World Bank, is assisting the Royal Government of Bhutan in conserving its forests and species diversity. The project has been testing a conservation trust fund as a way to provide long-term and sustainable support for biodiversity conservation. The project receives technical support from its partners—the World Bank, UNDP, World Wildlife Fund, and other NGOs—as well as financial support from donors such as World Wildlife Fund-US, the Asian Development Bank, and European countries.

PROMOTING ECOTOURISM IN UGANDA

Because the aesthetic and recreational features of mountains attract numerous tourists, governments and mountain communities increasingly regard tourism as an important economic activity. To be sustainable, however, ecotourism must include incentives to conserve local ecosystems.

One example is found in Uganda's Bwindi Impenetrable Forest and Mgahinga Gorilla national parks. These two parks protect some of the most biologically diverse tropical forests in East Africa. Both parks conserve rare and dwindling Afromontane and Afro-alpine forests that harbor rare mountain gorillas and other unusual mammals and endemic bird species. They also serve as important water catchments and sources of forest products for local communities.

GEF funded a project, managed by the World Bank and executed by Uganda's Ministry of Tourism, Wildlife, and Antiquities, to conserve biodiversity in the two parks. The project supported park management and related research activities and funded grants to help local community groups develop alternatives to traditional activities that generate income from harvesting forest resources sustainably, for example, beekeeping and agroforestry. The project also promotes ecotourism that does not damage the area's unique natural heritage.

To provide reliable, long-term funding for conservation activities in the parks, the project created the Mgahinga and Bwindi Impenetrable Forest Conservation Trust Fund. Income from the trust fund is now being used to conserve the parks' biodiversity, maintain watershed protection and erosion control, and provide long-term economic gains for local communities.

Community support for project goals was strengthened by involving community representatives as full partners in decision making. A Trust Management Board representing local communities as well as NGOs and the government will allocate the fund's net income to selected park management, research, and community eco-development projects.

Approved by GEF Council: 1991
GEF funding: $4.43 million
Cofinancing: $2.31 million
Total funding: $6.74 million

Syria. A GEF project, managed by the World Bank, is working to reduce population pressures on a fir/cedar forest in a Syrian mountain area called Jabal al Nusayriyah. The area is home to rare species of plants and a variety of migratory birds, but is severely threatened by continued agricultural expansion, grazing, firewood collection, and recreational activities. The GEF project is promoting sustainable use of natural resources and helping local communities identify and adopt alternative livelihoods.

Europe and Central Asia

Mountain ranges often represent national boundaries. A number of GEF projects in Europe and Central Asia target biodiversity protection in transboundary mountain areas. They focus on coordinating management activities among countries or reconciling national policies or regulations and institutional arrangements.

CONSERVING NATIVE POTATO VARIETIES IN BOLIVIA

People of the Andean region of South America long ago domesticated the wild potato and other tubers and have since cultivated hundreds of potato varieties. The sani negra is just one of many native potato varieties adapted to semiarid high plains and mountain valleys of the southern Andes. Introduction of imported, high-yielding potatoes, however, has eroded the genetic diversity of native varieties. Other reasons for the decline are vanishing knowledge about potato germplasm; inadequate management of potato germplasm and soils; and government policies and donor programs promoting exotic potato varieties. As a result, several native varieties have been entirely lost in many localities and others have been displaced to a significant extent. The sani negra, for example, has been reduced by 90 percent.

To address these issues, the GEF Small Grants Programme (see box, page 19) funded the Recovery, Management, and Conservation of the Native Potato Variety Sani Negra Project, which operates near La Paz, Bolivia. The project illustrates the importance of conserving genetic resources to help ensure the economic and nutritional well-being of present and future generations.

Under this project, the NGO Centro de Promoción de la Mujer provided technical assistance to households in an Aymara community on conserving, managing, and producing the sani negra and other potato varieties. Specifically, they learned how to recover and improve local sani negra genetic resources for seed potato reproduction. The thirty-five families involved have so far cultivated 8.5 hectares of sani negra seed potatoes and produced 32.5 tons of seed potatoes for their own use and for sale in five neighboring communities. More significant, the project has improved the families' capacity to conserve local, indigenous knowledge about agrobiodiversity and its conservation.

Approved by National Steering Committee for the Small Grants Programme: 2000

Total GEF funding through the Small Grants Programme: $24,070

Kyrgyzstan, Kazakhstan, and Uzbekistan. A GEF project in the West Tien Shan mountain range in these three countries is intended to protect the area's vulnerable and unique biological communities. The project is strengthening and coordinating national policies or regulations and institutional arrangements for biodiversity protection as well as strengthening and expanding a network of zapovedniks (nature reserves). Managed by the World Bank, this transnational project is the first of its kind in the Tien Shan range.

Latin America and the Caribbean GEF supports many activities to protect biodiversity in mountainous areas of Latin America and the Caribbean. They range from conservation efforts by indigenous communities in relatively small areas to formulation of a biodiversity plan for an entire nation.

Mexico. In the states of Oaxaca, Michoacán, and Guerrero in Mexico, a GEF project, managed by the World Bank, is helping communities effectively conserve biodiversity. The project is helping to establish community conservation areas on biologically diverse land in which sustainable use of biodiversity can help local residents to generate income. In addition, the project supports community-based biological corridors, capacity building for biodiversity conservation and management, indigenous knowledge, and identification of sustainable financing for landscape-wide conservation.

Colombia. GEF funded a project in the Colombian Andes, which harbors some of the world's most diverse plants and animal species. The project, managed by the World Bank, is helping Colombia implement a national biodiversity plan and apply key strategies for conservation and sustainable and equitable use of biological resources in the region.

MAINTAINING WATER FLOW

WATER IS CRITICAL TO ALL LIVING MATTER ON EARTH, AND MOUNTAINS ARE THE WORLD'S LARGEST WATER RESERVOIRS.

Mountains capture 80 percent of earth's fresh surface water in ice caps, glaciers, or other forms and supply all major rivers in the world. Each day, half of all people quench their thirst from mountain water. More than three billion people on earth depend directly or indirectly on water flowing from mountains for drinking, agriculture, electricity, and industry. Rivers originating in mountain ranges often provide fresh water for other countries downstream.

As the world's "water towers," mountains play an influential role in regional climates. Their shape and size force global air currents upward; moisture in the air condenses into clouds and falls as rain or snow. Mountain forests capture this precipitation and release it slowly into streams and rivers, providing a continuous flow of water to lowlands. As barriers to the flow of moisture-bearing wind, mountains greatly influence precipitation patterns in a region. For example, the Himalayas are key to both the occurrence of the monsoon in northern India and arid conditions in continental Central Asia.

The same factors that threaten mountain biodiversity also threaten the immense water flows from mountains.

- First, the population of the planet has doubled in the past century, while demand for freshwater has jumped sixfold. More than 2 billion people experience chronic water shortages, sometimes hindering their ability to grow food and threatening food security. By 2050 as many as 4.2 billion people may not have adequate supplies of fresh water.
- Second, economic activities such as forestry, agriculture, and mining in mountains are linked with reduced water flow and agricultural and fishery productivity in lowlands.
- Third, accelerated glacial melting, which some scientists attribute to climate change, threatens key sources of freshwater in some countries.
- Fourth, lack of coordination among countries on transboundary issues contributes to watershed management problems. Conflicts over water are sure to increase if countries do not begin to cooperate on water management.

As part of GEF's efforts toward more comprehensive ecosystem-based approaches to managing international waters, GEF is working to restore and maintain mountain ecosystems associated with international waters. One example is the Bermejo River in Argentina and Bolivia (see box, page 14). Because GEF recognizes that land and water issues are integrally linked, it also encourages government, NGOs, the private sector, and individuals to integrate environmental programs on these two issues.

PROTECTING SOUTH AMERICAN WATER RESOURCES

The Bermejo River in Argentina and Bolivia is a tributary of the Paraguay River, which, together with the Paraná and Uruguay Rivers, drains nearly one-fifth of the South American continent to the Atlantic Ocean. The Bermejo extends from high in the Andes Mountains about 1,300 kilometers to the Paraguay River. The upper basin of the Bermejo River Basin includes the high mountain rivers Iruya and Río Grande, among others.

For a century, unsustainable practices such as systematically extracting trees of the highest commercial value has diminished biodiversity and impoverished forests. Overgrazing has been widespread since 1900 and, in some areas, has eliminated vegetative cover, causing soil erosion and desertification. Both forestry and grazing have aggravated sedimentation in the river basin, helping degrade the environment downstream. Both the Iruya and Río Grande, in particular, suffer from a high degree of sedimentation due to eroding soils.

A GEF project, managed by the Organization of American States with UNEP as the implementing agency, is working to enhance and restore the environmental functioning of the entire Bermejo River system and protect endemic species within the watershed's five ecosystems—montane, humid forest, arid Chaco/savannah, sub humid Chaco, and humid Chaco.

Subprojects are promoting integrated management of natural resources for both the Iruya and Río Grande rivers, among others. A transparent, public interaction process has developed a strategic action program for the Bermejo river basin, which identified community-based mechanisms for addressing root causes of soil degradation and protecting water resources. The project will also support creation of the institutional, legal, and informational bases necessary to implement these mechanisms. Key project elements are strengthening the basin's institutions, building agency and organizational capacity, integrating environmental concerns into economic development activities on a sustainable basis, and promoting public awareness and participation. Goals include reduced soil loss, improved flood forecasting, improved water quality, maintenance of biodiversity and ecosystems, and more effective and sustainable use of available water resources.

Approved by GEF Council: 2000
GEF funding: $11 million
Cofinancing: $8.7 million
Total funding: $19.7 million

PROTECTING LAKE ATITLÁN IN GUATEMALA

The Lake Atitlán watershed in the western highlands of Guatemala is an excellent example of the natural, cultural, and economic complexity that characterizes human settlements in mountain ecosystems and can raise environmental problems. The area's natural beauty and rich cultural heritage, for example, make the area a major tourist destination, but development has affected the environment and the way of life of local Caqchikel and K'iché ethnic communities living around the Lake Atitlán protected area and national park. Increased coffee production since the 1980s has brought economic benefits, but also led to significant loss of forest cover and soil degradation as well as water pollution by agrochemicals.

To reverse the downward spiral, GEF projects funded through its Small Grants Programme, which is managed by UNDP, are working with local farmer associations to promote organic coffee farming and culturally sensitive ecotourism in the upper reaches of the Lake Atitlán watershed. One such small project instructed thirty-six community trainers in organic coffee farming practices and techniques, which they in turn disseminated in their communities using on-site demonstrations and technical assistance. To date, 650 small farmers have used these skills and knowledge to switch from conventional to organic coffee production. Project workshops on organic and natural shade coffee certification and marketing practices are also helping to ensure a niche for biodiversity-friendly coffee in international fair trade markets.

Another GEF Small Grants Programme project facilitated development and construction of the Uk'ux K'achelaj rural ecotourism center on a farm owned by a local community association. Trained community members are providing services to tourists, including traditional foods, thermal baths, and guided walks on nature trails. Replication of such efforts in other communities in the Lake Atitlán watershed will expand better conservation and management of mountain biodiversity and water resources.

Technical Support for the Lake Atitlán watershed organic coffee producers consortium
Year Approved: 2000
Grant Amount: $29, 621

Creation of an integrated rural ecotourism center at UK'ux K'achelaj
Year Approved: 2000
Grant Amount: $19,693

CONSERVING MOUNTAIN LANDSCAPES

MOUNTAIN FORESTS AND OTHER LANDSCAPES PROVIDE PEOPLE WITH MANY PRODUCTS AND SERVICES.

These may be divided into three general types—productive, protective, and enriching:

- Productive. Production landscapes in mountains include forests (wood for fuel, construction, wood working, and more), nontimber products (herbs, mushrooms, animals, and so on), grazing land and fodder for domesticated and wild animals, as well as high-quality water supplies.
- Protective. Mountain forests and other vegetative cover provide protective ecological functions that benefit people. These include decreasing the risk of natural hazards (landslides, avalanches, floods, and so on), protecting watersheds, preventing soil erosion, providing habitats for fauna, conserving biodiversity, and sequestering carbon to mitigate climate change.
- Enriching. Mountain landscapes also provide places for recreation and tourism, as well as religious, aesthetic, and cultural inspiration.

In developing countries and regions, demand for marketable products from mountains is large and often expanding. To conserve mountain environments, however, forestry and other uses of mountain landscapes must also take into account the protective and enriching aspects of mountainous areas.

Many of the same human activities that threaten mountain biodiversity and waters also threaten mountain landscapes, particularly their vitally important forests; during the 1990s mountainous areas suffered greater forest loss than any type of lowland forest. Tourism, when conducted in an unsustainable way, leaves litter, trampled vegetation, and trees cut for firewood. Mining is also a particular threat. In the Khaniara of India's Himachal Pradesh, for example, nearly 1,000 slate mines have stripped 60 percent of the forest cover, triggering countless landslides.

GEF land degradation activities at the same time support its concern for conserving biodiversity, protecting international waters, and addressing climate change. GEF recognizes that land and water issues are integrally linked, and encourages government, NGOs, the private sector, and individuals to integrate environmental programs on these two issues.

ADDRESSING OVERGRAZING IN THE CAUCASUS

The Caucasus mountain range contains a range of types of flora—arid, semiarid, arid sparse forests, steppe, elements of deciduous forests, rocky xerophytes, floodplain forest, and foothill bushes. A dry climate, long hot summers, and mild short winters characterize the mountains' arid and semiarid ecosystems, which harbor one of the greatest populations of endemic and endangered species in the Caucasus, including the lynx and Persian gazelle.

Few people live year-round in the region, but they drive their livestock here for the winter season from Georgia's south and center and from Azerbaijan and Armenia. Overgrazing in the region has led to widespread and visible soil erosion and loss of indigenous flora. Intensive hunting and habitat loss have also resulted in a sharp drop in the numbers of threatened and endangered species.

A GEF project, managed by UNDP, has begun to address these problems. It has conducted surveys on the density of animal grazing, rotation patterns, and hunting in the area. One finding was that sheep density (twelve per hectare) was three times the permitted level. The project has focused on the full magnitude of the problems facing the area. It has gone on to identify recovery techniques, draft an ecosystem management plan, and raise awareness through publications, radio and television programs, and training workshops.

Pilot demonstration projects include establishing experimental hunting farms that separate zones for hunting and for different types of protection. The project will complement and coordinate with neighboring countries in the Caucasus that share the ecosystem.

Approved by GEF Council: 1999
GEF funding: $0.75 million
Cofinancing: $0.13 million
Total funding: $0.88 million

MOUNTAINS AND THE CLIMATE CHALLENGE

The global threat presented by a changing climate could have significant impacts on mountain environments—particularly on ecosystems, biodiversity, and water flow. By implication, climate change could also greatly affect the lives of mountain people. GEF's worldwide efforts to address climate change impact mountains, both indirectly and directly, as well as benefit local people through access to clean renewable energy.

Retreating glaciers and increasing water levels in glacier lakes are already affecting mountain environments in some parts of the world, a trend that scientists predict will accelerate with climate change. This will affect water supplies in countries that rely on snow and glacial melt and may lead to floods and avalanches. Some scientists report, for example, that as many as fifty glacial lakes in Nepal and Bhutan may burst their banks within 5 years, flooding valleys and endangering lives, property, and infrastructure.

As dynamic and vertical landscapes, mountainous areas are overall more sensitive to climate change than lowlands. Mountains exhibit different altitudinal belts of vegetation and associated fauna due to decreases in temperature, increases in radiation, and usually decreasing soil depth and fertility at higher altitudes. The predicted rise in global temperatures of 3.25 degrees centigrade could translate to an ecological shift upward of 500 meters in altitude.

Global warming is likely to have some of its most severe ecological impacts on mountain flora and fauna, which will not have enough time to adapt to new climatic conditions; rare animals and plants are the most vulnerable. Some scientists have already reported examples of species moving uphill in mountainous areas looking for more suitable habitat as climatic conditions change; however, barriers formed by rugged mountain topography may prevent some species from shifting to more suitable habitats, even if an equivalent area of habitat is available. In reality, the area of land available decreases with altitude, so any climate-induced upward movement of ecosystems will probably reduce population size and diversity of species.

GEF is playing a catalytic role in promoting sustainable energy development, which will help mitigate the impacts of global warming on mountain environments. GEF aims to:

- Remove barriers to energy conservation and energy efficiency
- Promote the adoption of renewable energy by removing barriers and reducing implementation costs
- Reduce the long-term costs of low greenhouse gas–emitting energy technologies
- Foster environmentally sustainable transportation systems
- Identify and implement measures to adapt to the impacts of climate change.

GEF's renewable energy projects also directly support mountain communities situated far from existing power grids by providing access to cost-effective and sustainable energy. GEF, for example, promotes renewable energy in mountain ranges from Argentina to Uganda. The GEF Small Grants Programme is also supporting local communities in addressing their energy needs. For example, in Nepal, Himalayan villages have turned to solar power for light and energy needs. Because the cost of solar power systems are beyond the reach of most villagers, the NGO Himalayan Light Foundation has partnered with the village of Bongadovan to devise a way for women to pay for the systems by knitting traditionally designed bags. Twenty-four bags pays for a system, and money from sale of any additional bags is returned to the household. In Bhutan, the National Women's Association has initiated a project to make biomass briquettes as a substitute for fuel wood, using waste material such as sawdust and underutilized lemongrass.

GEF is also expanding its efforts to support adaptation to climate change in response to recent decisions of the UN Framework Convention on Climate Change. This program is under development but is likely to include capacity building and technical assistance to help countries identify and prepare for the consequences of climate change.

SUSTAINING MOUNTAIN LIVELIHOODS

MOUNTAIN AREAS ARE HOME TO MILLIONS OF PEOPLE. MANY ARE INDIGENOUS GROUPS WHO HAVE MADE MOUNTAINS THEIR SOURCE OF LIVELIHOOD FOR THOUSANDS OF YEARS, OFTEN IN HARMONY WITH THEIR ECOSYSTEMS.

GEF PROJECTS ON MOUNTAIN BIODIVERSITY, WATERS, AND LANDSCAPES UNIFORMLY INVOLVE AND BENEFIT LOCAL PEOPLE.

Rugged and isolated terrain has encouraged a variety of unique mountain cultures with their own religions and traditions.

Many mountain dwellers, however, are among the most impoverished. A significant portion of the 1.3 billion people who live on less than one U.S. dollar a day live in mountainous areas. Many of the least developed countries are mountainous (e.g., Nepal, Laos, Ethiopia, Bolivia, Rwanda, Papua New Guinea, and Albania).

● ONE IN TEN PEOPLE LIVE ON MOUNTAINS.

Sustainable development in mountain areas, therefore, must also assure that the benefits of conservation accrue to mountain people over the long term. The GEF projects on mountain biodiversity, waters, and landscapes described above—and GEF projects in general—uniformly involve and benefit local people. GEF projects emphasize in particular the important role and knowledge of women and indigenous groups in conservation and sustainable development.

Nepal. GEF's Nepal Biodiversity Conservation Project, managed by UNDP, established community forest user groups and grazing user groups using existing village systems of cooperation and comanagement. The user groups were legalized so they had authority to enforce their own rules and manage their own funds. As a result, forest area under community management increased by more than 40 percent. Community forest user groups also increased the participation of women in forest management by training more than 400 women in tree planting and maintenance and sustainable agroforestry livelihoods.

Turkey. Koprulu Kanyon National Park, in the Taurus Mountains of southern Turkey, is a World Heritage Site that includes ruins of the ancient (400 B.C.) city of Selge and the Greco-Roman Theater. A GEF project, managed by the Government of Turkey and the World Bank, is encouraging 18 villages with a population of 25,000 people to adopt sustainable agricultural practices in the cultivation of traditional food crops, wheat, and barley, as well as the harvesting of pine resin. In addition, the project hires local people for *in situ* park conservation activities and grants small loans for ecotourism. Conservation is directed toward conserving the world's largest remaining pristine cypress (Cupressus sempervirens) forests and the Mediterranean maquis, the thick underbrush unique to the region.

Peru. In the Tumbes region of Peru lies one of the country's critical areas, the Northwest Biosphere Reserve, where deforestation rates exceed 2 percent per year. Managed by the Peruvian NGO Pro

GRASSROOTS ACTION THROUGH SMALL GRANTS

GEF's Small Grants Programme, launched in 1992, supports community-based initiatives that help conserve globally significant biodiversity, mitigate global climate change, and protect international waters. In the past decade, the program has reached out to NGOs and communities in more than sixty countries and demonstrated the synergy between improved local livelihoods and global environmental benefits.

The Small Grants Programme has funded more than 3,000 projects worldwide, testing appropriate technologies, reviving and using traditional and indigenous knowledge, developing participatory processes, building organizational capacities, and raising awareness about global environmental problems. The program is rooted in the belief that biodiversity conservation cannot be achieved without addressing community needs; therefore, the program supports strategies for sustainable livelihoods that benefit both communities and targeted ecosystems. In mountainous areas, in particular, the program has in the past 10 years supported 158 projects for a total investment of more than $3 million, employing various approaches:

- Conserving agrobiodiversity on site by, among other means, applying local and indigenous knowledge on protecting genetic crop resources and using modern technologies for conservation farming.
- Protecting endangered animal and plant species and the mountain ecosystems on which they depend—from the brown bear and wooly flying squirrel in Pakistan and golden eagle in Kazakhstan to traditional rice varieties in Vietnam and Andean potato and other native tuber varieties in Bolivia, Ecuador, and Chile.
- Working with communities to relieve pressure on national parks and protected areas in mountainous regions, for example, community-managed ecotourism in Bhutan's Jigme Dorji National Park or community participation in the conservation and management of natural resources on Indonesia's Dieng Mountain.
- Integrating protection of cultural and historical resources with biodiversity conservation by involving indigenous peoples in the majority of country programs and by protecting sacred spaces such as those on Mt. Kenya in Kenya and Mt. Kilimanjaro in Tanzania.

Naturaleza and the World Bank, a GEF project is developing a strategy to encourage community stakeholders in the reserve to manage forests sustainably. The project involved local people—including women who often manage farms—in selecting demonstration sites; women's groups now manage ten of the sites. The demonstration projects integrate social programs, such as health and childcare. One, for example, links maintenance of women's home gardens with food production and medicinal plants.

Ethiopia, Kenya, and Mali. A GEF project managed by UNEP is documenting traditional practices and uses of grasses at three pilot sites in Africa—including information collected by indigenous communities themselves on grass germplasms that might be used in managing pests in agriculture. The pilot site in Ethiopia involves tribal groups of the Oromo, Amhara, Wolaita, and Gurache; in Kenya, the Luhya, Luo, and Kambas; and, in Mali, the Bobo, Peulh, Snoufo, Minianka, Bambara, Sarakole, Malinke, Kakolo, Dogon, Sonria, Maures, and Mossi. The international NGO Environment Liaison Centre is working with the International Centre of Insect Physiology and Ecology to document indigenous grass and insect biodiversity. The National Museum of Kenya has provided facilities for insect collection by ICIPE scientists and local tribal groups.

TAPPING LOCAL RESOURCES IN PAKISTAN

Dominated by some of the world's highest peaks, the Karakoram, Hindu Kush, and Western Himalayan mountain ranges of northern Pakistan contain a rich mix of languages and cultures. The flora and fauna of the region are equally diverse with several globally significant species represented, including the snow leopard and Himalayan ibex. The region is also a center for agrobiodiversity, for example, morel mushrooms, wild thyme, cumin, wild rose, walnuts, pine nuts, apricots, costus roots, and other species. Ethnobotanical records show that more than 200 species of plants are used in local medicines.

The conventional approach to conservation in these high mountains was to establish national parks and wildlife sanctuaries without consulting nearby communities. However, the GEF's Pakistan Mountain Areas Conservancy Project, managed by UNDP, is giving local people as well as forestry and wildlife experts a voice in decision making through a newly formed conservation committee. The committee developed a conservation plan, which not only controlled hunting, but also channeled most of the revenues to a village conservation fund that has already been tapped to bring clean drinking water from a glacier. The project also helped establish four wildlife conservancies, encompassing a representative sampling of biogeographic zones of the high mountains. Within the conservancies, activities are facilitating on-site conservation of habitats and species and promoting sustainable uses of biodiversity.

The villagers helped produce a guidebook on wildlife management that is used as a learning tool. Schoolchildren study the rich collection of more than 300 animals and 1,000 plants that help make their homeland unique.

Approved by GEF Council: 1998
GEF funding: $10.60 million
Cofinancing: $7.70 million
Total funding: $18.30 million

LOOKING TO THE FUTURE

GEF HAS PROVIDED BROAD ASSISTANCE AND MADE TARGETED EFFORTS TO CONSERVE MOUNTAIN BIODIVERSITY AND SUSTAINABLE MOUNTAIN DEVELOPMENT.

In its first decade, GEF has become the largest source of grant funding to this end for developing countries and countries in economic transition. GEF has been a catalyst, working with national and local governments, multilateral and bilateral groups, private companies, NGOs, and individuals to address complex environmental issues in a very pragmatic way on the ground.

As governments and other concerned parties identify new tools and approaches for the conservation and sustainable development of mountains, GEF's support and assistance will continue to evolve. Through its new roles and funding responsibilities—such as land degradation and persistent organic pollutants—GEF can expand its mandate and range of programs to overcome threats to mountains.

Integrated Ecosystem Approach

GEF is promoting widespread adoption of integrated ecosystem management—comprehensive interventions in ecosystems that integrate ecological, economic, and social goals to achieve multiple and cross-cutting benefits. A new generation of GEF projects:

- Support biodiversity conservation and sustainable use in agriculture and other production landscapes and seascapes as well as in parks and protected areas, managing them holistically within natural boundaries.

GEF HAS BECOME THE PRIMARY SOURCE OF GRANT FUNDING FOR CONSERVATION AND SUSTAINABLE DEVELOPMENT OF MOUNTAINS IN DEVELOPING COUNTRIES AND COUNTRIES IN ECONOMIC TRANSITION.

- Promote programs that cross sectors and integrate the management of diverse ecosystems.
- Link biodiversity conservation, climate change mitigation, and management of transboundary waters, addressing policy and governance issues in both areas.

Typical GEF activities may include improved management of a forested watershed to achieve multiple benefits, including improvements in soil and water conservation, aquatic biodiversity conservation, flood control, minimization of sedimentation of globally important water bodies, and reduction of net emissions or improved storage of greenhouse gases. The integrated ecosystem management approach is especially important when people in lowlands and highlands work together to protect their watersheds and develop sustainably.

Supporting Synergies among Conventions

Countries around the world have adopted far-reaching international legal agreements addressing environmental issues. These agreements often set overlapping obligations for ratifying countries. GEF is uniquely positioned to assist countries in fulfilling obligations

under multiple treaties. For example, GEF projects to conserve and manage alpine ecosystems, including glacier lakes, help countries fulfill obligations under the Convention on Biological Diversity, the U.N. Framework Convention on Climate Change, and the U.N. Convention to Combat Desertification. Similarly, GEF projects to control pollution and diminish the risk to endangered and threatened wildlife help countries fulfill their obligations under the Convention on Biological Diversity, the Law of the Sea Convention, and the MARPOL Convention.

Studies in Switzerland have demonstrated the high level of persistent organic pollutants (POPs) in remote mountain lakes. In 2001 GEF was designated as the interim financial mechanism for the Stockholm Convention on Persistent Organic Pollutants. GEF provides funding to assist eligible countries in preparing national implementation plans, as called for by the convention. This will allow countries to report to the Convention of the Parties and to take the strategic and policy measures needed to reduce POPs.

Long-Term Sustainability

The action plan that emerged from the World Summit on Sustainable Development provides a road map to global sustainability. GEF is moving toward that goal by setting new strategic priorities that focus on creating long-term global environmental benefits while improving local livelihoods. These priorities have particular relevance to mountain conservation and sustainable development:

First, GEF will emphasize long-term, country-driven, and holistic approaches to its ongoing and new support for protected areas. This means building the capacity of protected area systems to sustain ecosystem integrity well into the future. It also means encouraging an enabling environment for success—legislation, policies, and sources of funding that support sustainability, cost-effective and sustainable institutions for managing protected areas, as well as sustainable sources of funding.

Second, GEF will work to mainstream the conservation of biodiversity by building capacity to do so within agriculture, forestry, energy, water, fisheries, and other sectors. This will involve many partners, such as governments, NGOs, local communities, and the private sector. GEF will fund demonstration projects that conserve biodiversity across a mosaic of production landscapes.

Third, GEF will increase the dissemination of lessons learned, best practices, and innovative approaches and tools. This includes facilitating the development of "knowledge networks" for distributing such information.

Fourth, GEF will expand its efforts to help developing countries respond to global environmental challenges, including adaptation to the threats presented by a changing climate.

With its robust replenishment by donor nations, GEF has the unique opportunity to integrate environmental sustainability into efforts to improve the quality of life for all people. The challenge is to ensure that development for people is pursued within a framework of long-term sustainability. A partnership for global sustainability that lifts future generations from poverty and protects our planet is within reach.

GEF FUNDING PATHWAYS

WHO CAN RECEIVE GEF FUNDING FOR MOUNTAINS PROJECTS?

Grant recipients can range from a mountain community to a private company, to a government agency responsible for mountain environments. It can be any person, group, or agency in a developing country who has a good idea for addressing an environmental concern in mountain environments—for example, an innovative system to conserve and use endemic mountain plant species sustainably or identify and develop a scenic natural area for sustainable ecotourism and local benefit.

GEF provides grants for projects that will either protect or reduce risks to the global environment. GEF provides small grants and finances medium- and full-sized projects. Those seeking GEF funding develop their project ideas by working with GEF's implementing or executing agencies.

To date, GEF has disbursed nearly 3,000 small grants directly to NGOs and community groups in 63 countries through its Small Grants Programme (see box, page 20). Local UNDP offices are responsible for quickly and flexibly dispersing small grants, up to $50,000 each, for projects that reconcile global environmental benefits with sustainable livelihoods for local communities. National steering committees play a prominent role.

Medium-sized grants, which are for projects of up to $1 million, and large-sized grants, which start at $1 million, are approved through a more formal process. Because of their complexity, full-sized projects (GEF's most common type of project) can require more time than medium-sized projects to move from idea to implementation.

In addition, GEF funds "enabling activities," that is, activities that help countries prepare national strategies and action plans to fulfill their obligations to global environmental conventions. For enabling activities, especially those relating to biodiversity, countries are expected to strengthen their ability to formulate and manage sectoral or cross-sectoral programs to meet biodiversity objectives within the context of national sustainable development efforts; thus, enabling activities are important tools for mountainous countries in justifying mountain conservation and sustainable development at the national level.

ANNEX: GEF INVESTMENTS IN MOUNTAINS (FISCAL 1991–2002)*

COUNTRY	PROJECT NAME	MOUNTAIN RANGE/ MOUNTAINS	IMPLE-MENTING AGENCY	GEF (US$ MILLIONS)	COFINANC-ING (US$ MILLIONS)	TOTAL COST (US$ MILLIONS)
Global	Barriers and Best Practices in Integrated Management of Mountain Ecosystems		UNEP	0.93	1.20	2.13
Global	Millennium Ecosystem Assesment		UNEP	7.31	17.61	24.92
Global (Côte d'Ivoire, Czech Republic, Kenya, Malawi, Mauritius, New Zealand, Poland, South Africa)	Development of Best Practices and Dissemination of Lessons Learned for Dealing with the Global Problem of Alien Species That Threaten Biological Diversity		UNEP	0.75	3.23	3.98
Regional (Bolivia, Costa Rica, Mexico, Peru, Belize, Ecuador, El Salvador, Panama, Paraguay)	EcoEnterprises Fund		World Bank	1.00	9.00	10.00
Regional (Brazil, Chile, Colombia, Dominican Republic, Guyana, El Salvador, Mexico, Nicaragua, Paraguay, Peru, Uruguay, Venezuela	Building Wider Public and Private Constituences for the GEF in Latin America and the Caribbean: Regional Promotion of Global Environment Protection through the Electronic Media		UNDP	1.00	0.96	1.96
Regional (Ecuador, Kenya, Philippines, Ukraine)	Biodiversity Indicators for National Use		UNEP	0.85	0.61	1.46
Regional (Honduras, Nicaragua, Panama, Dominican Republic)	Biodiversity Conservation and Integration of Traditional Knowledge on Medicinal Plants in National Primary Health Care Policy in Central America and Caribbean		UNEP	0.75	0.80	1.55
Regional (Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama)	Establishment of a Programme for the Consolidation of the Meso-American Biological Corridor		UNDP /UNEP	10.94	12.77	23.71
Regional (Kenya, Tanzania, Uganda)	Reducing Biodiversity Loss at Cross-Border Sites in East Africa	Rift Valley Mts. Southwestern Highlands, Mt. Kenya, Rwenzori Mts.	UNDP	12.90	5.53	18.43
Regional (Lesotho, South Africa)	Maloti/Drakensberg Conservation and Development Project	Drakensberg and Maloti Mts.	World Bank	15.55	17.70	33.25
Regional (Kyrgyz, Kazakhstan, Uzbekistan)	Central Asia Transboundary Biodiversity Project	West Tien Shan Range of Central Asia: Talassky Alatau Range, Chatkal Range, Chatkal'skiy Range and Ugamsky Range	World Bank	10.50	3.50	14.00
Regional (Bolivia, Peru)	Conservation of Biodiversity in the Lake Titicaca Basin	Central Andes	UNDP	3.11	0.89	4.00
Regional (Ethiopia, Kenya, Mali)	Conservation of Gramineae and Associated Arthropods for Sustainable Agricultural Development in Africa	Great Rift Valley	UNEP	0.97	1.56	2.53
Regional (Argentina, Bolivia)	Strategic Action Programme for the Binational Basin of the Bermejo River	Cordillera des los Andes	UNEP	3.22	2.74	5.96
Regional (Argentina, Bolivia)	Implementation of Strategic Action Program for the Bermejo River Binational Basin: Phase II	Cordillera des los Andes	UNEP	11.04	8.73	19.77
Algeria	Conservation and Sustainable Use of Globally Significant Biodiversity in the Tassili and Ahaggar National Parks	Tassili plateau, Atakor massif, Téfedest massif	UNDP	3.72	2.55	6.27
Armenia	Natural Resources Management and Poverty Reduction	South Caucasus	World Bank	5.21	11.00	16.21
Bhutan	Trust Fund for Environmental Conservation	Himalayan Highlands	World Bank	10.00	7.57	17.57
Bhutan	Integrated Management of Jigme Dorji National Park	Himalayan Highlands	UNDP	1.50	1.03	2.53

COUNTRY	PROJECT NAME	MOUNTAIN RANGE/ MOUNTAINS	IMPLE-MENTING AGENCY	GEF (US$ MILLIONS)	COFINANC-ING (US$ MILLIONS)	TOTAL COST (US$ MILLIONS)
Bolivia	Biodiversity Conservation	Cordillera Central de los Andes, Cordillera de Lipez, Cordillera Apolobamba, Cololo Massive	World Bank	4.54	3.85	8.39
Bolivia	Sustainability of the National System of Protected Areas	Cordillera Central de los Andes, Cordillera de Lipez, Cordillera Apolobamba, Cololo Massive	World Bank	15.30	31.40	46.70
Brazil	Parana Biodiversity Project		World Bank	8.00	24.86	32.86
Cambodia	Developing an Integrated Protected Area System for the Cardamon Mountains	Cardamon Mts	UNDP	1.00	3.33	4.33
Cameroon	Community-Based Conservation in the Bamenda Highlands	Mount Oku	UNDP	1.00	2.09	3.09
Chile	Ecosystem Management of the Salar del Huasco for Biodiversity Conservation and Sustainable Use Outside Protected Areas	High Andean Plateau region	UNDP	0.86	1.87	2.73
Chile	Santiago Foothills: Mountain Ecosystem Conservation	Santiago Foothills	World Bank	0.75	0.46	1.21
Chile	Water Resources and Biodiversity Management	Cordillera de los Andes	World Bank	10.33	310.00	320.33
China	Nature Reserves Management	Qingling Mts., Wuyi Mountain Range	World Bank	17.90	5.70	23.60
China	Wetland Biodiversity Conservation and Sustainable Use	Ruoergai Plateau (Tibetan Plateau)	UNDP	12.03	23.02	35.05
China	Sustainable Forest Development Project, Protected Areas Management Component	Micangshan, Minshan, Wulingshan, Fanjingshan, Hengduanshan	World Bank	16.35	46.15	62.50
China	Multiagency and Local Participatory Cooperation in Biodiversity Conservation in Yunnan Upland`s Ecosystem	Hengduan mountain range	UNDP	0.75	0.00	0.75
Colombia	Conservation of Biodiversity in the Sierra Nevada de Santa Marta	Sierra Nevada de Santa Marta	World Bank	9.38	11.49	20.87
Colombia	Conservation and Sustainable Use of Biodiversity in the Andes Region	Cordillera Oriental, Andes del Norte, Cordillera Central, El Cocuy	World Bank	15.35	15.00	30.35
Colombia	Conservation of Montane Forest and Paramo in the Colombian Massif, Phase I	Central Cordillera, Eastern Cordillera	UNDP	4.03	6.87	10.90
Congo, DR	Rehabilitation of Protected Areas in the Democratic Republic of the Congo	Virunga Mts., Ruwenzori Mts., Mitumba Mts.	UNDP	6.33	13.64	19.97
Costa Rica	Biodiversity Resources Development	Talamanca Cordillera, Central Volcanic Cordillera	World Bank	7.28	13.00	20.28
Costa Rica	Conservation of Biodiversity and Sustainable Development in La Amistad and La Osa Conservation Areas	Cordillera de Talamanca	UNDP	8.00	0.00	8.00
Costa Rica	Conservation of Biodiversity in the Talamanca-Caribbean Biological Corridor	Cordillera de Talamanca, Chirripo	UNDP	0.75	0.52	1.27
Costa Rica	Ecomarkets	Cordillera de Talamanca, Cordillera de Guanacaste, Chirripo	World Bank	8.33	51.90	60.23
Costa Rica	Biodiversity Conservation in Cacao Agroforestry	Cordillera Guanacaste	World Bank	0.75	2.29	3.04
Cote d'Ivoire	National Protected Area Management Program	Massif of Nimba,Toura Mts.	World Bank	16.51	51.72	68.23
Croatia	Karst Ecosystem Conservation Project	Dinarids Mts	World Bank	5.30	3.33	8.63

GEF INVESTMENTS IN MOUNTAINS (FISCAL 1991–2002)* CONTINUED

COUNTRY	PROJECT NAME	MOUNTAIN RANGE/ MOUNTAINS	IMPLE-MENTING AGENCY	GEF (US$ MILLIONS)	COFINANC-ING (US$ MILLIONS)	TOTAL COST (US$ MILLIONS)
Ecuador	National Protected Areas System	Cordillera de los Andes del Norte	World Bank	8.35	6.40	14.75
Ecuador	Choco-Andean Corridor	Cordillera de los Andes	World Bank	1.00	2.35	3.35
Ecuador	Biodiversity Protection	Cordillera de los Andes del Norte	World Bank	7.52	1.50	9.02
Egypt	Conservation and Sustainable Use of Medicinal Plants in Arid and Semiarid Ecosystems	Gebel Musa (Mount Sinai), Gebel Katharina, Sinai Massif	UNDP	4.29	4.77	9.06
El Salvador	Promotion of Biodiversity Conservation within Coffee Landscapes		World Bank	0.75	3.09	3.84
Ethiopia	Conservation and Sustainable Use of Medicinal Plants	Ethiopian Highlands	World Bank	1.91	4.90	6.81
Georgia	Arid and Semiarid Ecosystem Conservation in the Caucasus	Caucasus Mts., Iori Plateau	UNDP	0.75	0.13	0.88
Georgia	Conservation of Forest Ecosystems	Caucasus Mts., Iori Plateau	World Bank	9.05	24.10	33.15
Guatemala	Integrated Biodiversity Protection in the Sarstun-Montagua Region	Sierra Madre	UNDP	4.00	5.70	9.70
Guatemala	Western Altiplano Integrated Natural Resources Management	Sierra Madre del sur	World Bank	8.35	43.10	51.45
Honduras	Honduras Biodiversity Project	San Juancito Mts.	UNDP/ World Bank	7.30	41.70	49.00
India	India Ecodevelopment	Central Himalya, Western Ghat Mts.,	World Bank	20.21	54.00	74.21
Indonesia	Conservation of Key Forests in the Sangihe-Talaud Islands		World Bank	0.84	0.36	1.20
Indonesia	Kerinci Seblat Integrated Conservation and Development	Bukit Barisan Mts., Gunung Kerinci	World Bank	14.40	25.50	39.90
Jordan	Conservation of the Dana and Azraq Protected Areas	Shara Mts.	UNDP	6.30	0.46	6.76
Jordan	Final Consolidation and Conservation of Azraq Wetlands and Dana Wildlands by RSCN to Address New Pressures	Shara Mts.	UNDP	1.95	1.35	3.30
Korea DPR	Conservation of Biodiversity in Mount Myohyang	Chang Pai Shan Mt. Range, Mt.Myohyang	UNDP	0.75	0.91	1.66
Lao PDR	Wildlife and Protected Areas Conservation	Annam Range	World Bank	5.00	0.20	5.20
Lebanon	Strengthening of National Capacity and Grassroots In- Situ Conservation for Sustainable Biodiversity Protection	Mount Lebanon Chain	UNDP	2.53	0.76	3.29
Lesotho	Conserving Mountain Biodiversity in Lesotho	Drakensberg-Malou Mts.	UNDP	2.51	4.63	7.14
Malawi	Mulanje Mountain Biodiversity Conservation Project	Mulanje Mts.	World Bank	5.30	1.53	6.83
Mexico	El Triunfo Biosphere Reserve: Habitat Enhancement in Productive Landscapes	Sierra Madre de Chiapas	World Bank	0.75	1.39	2.14
Mexico	Indigenous and Community Biodiversity Conservation (COINBIO)	Sierra Madre del Sur	World Bank	7.58	11.20	18.78
Mexico	Mesoamerican Biological Corridor	Sierra Madre del Sur in Chiapas	World Bank	15.20	78.11	93.31
Mexico	Consolidation of the Protected Areas Program (SINAP II)	Sierra Madre del sur, Sierra Madre Occi., Sierra Madre Oriental	World Bank	16.45	60.30	76.75
Mexico	Biodiversity Conservation in the Sierra Gorda Biosphere Reserve	Sierra Madre Oriental, Sierra Gorda	UNDP	6.73	13.92	20.65
Mongolia	Strengthening Conservation Capacity and Development and Institution of a National Biodiversity Conservation Plan (Implementation Phase I)		UNDP	1.50	0.35	1.85

COUNTRY	PROJECT NAME	MOUNTAIN RANGE/ MOUNTAINS	IMPLE-MENTING AGENCY	GEF (US$ MILLIONS)	COFINANC-ING (US$ MILLIONS)	TOTAL COST (US$ MILLIONS)
Morocco	Protected Areas Management	Anti Atlas, High Atlas, Middle Atlas	World Bank	10.35	3.40	13.75
Morocco	Transhumans for Biodiversity Conservation in the Southern High Atlas	High Atlas	UNDP	4.37	6.07	10.44
Nepal	Biodiversity Conservation in Nepal	Himalaya, Mt.Makalu	UNDP	3.80	2.70	6.50
Nepal	Upper Mustang Biodiversity Conservation	Central and Eastern Himalaya: Annapurna Range	UNDP	0.73	1.28	2.01
Nepal	Arun Valley Sustainable Resource Use and Management Pilot Demonstration Project	Himalayan Highlands	UNEP	0.63	0.18	0.81
Nicaragua	Atlantic Biodiversity Corridor	Cerro Saslaya, El Inocente, Albondiga,Garrapata, El Toro, La Pimienta, El Horimiguero	World Bank	7.43	43.60	51.03
Pakistan	Maintaining Biological Diversity with Rural Community Development	Hindu Kush, Karakoram, Western Himalaya, Naga Parbat	UNDP	2.50	0.00	2.50
Pakistan	Protected Areas Management Project	Hindukush, Suleinam Range	World Bank	11.14	15.70	26.84
Pakistan	Mountain Areas Conservancy Project	Hindu Kush, Karakoram, Western Himalaya, Naga Parbat	UNDP	10.60	7.70	18.30
Panama	Biodiversity Conservation in the Darien Region	Darién, Sapo, Jungurudo and Pirre mountain ranges	UNDP	3.00	0.50	3.50
Panama	Atlantic Biological Corridor Project	Talamanca, Tabascara, Darién, Sapo, Jungurudo and Pirre Mountain Ranges , Volcan Baru	World Bank	8.59	30.90	39.49
Papua New Guinea	Biodiversity Conservation and Resource Management	Bismarck Range and Verron Range (New Ireland)	UNDP	5.00	1.80	6.80
Papua New Guinea	Forestry and Conservation Project	Central, Bismarck and Owen Stanley Ranges	World Bank	17.30	38.50	55.80
Peru	National Trust Fund for Protected Areas	Cordillera de Carabaya, Cordillera Amotape, Cordillera Oriental de los Andes	World Bank	5.02	2.86	7.88
Peru	Collaborative Management for the Conservation and Sustainable Development of the Northwest Biosphere Reserve	Amotape Mtn. Range	World Bank	0.75	1.35	2.10
Peru	In-Situ Conservation of Native Cultivars and Their Wild Relatives	Sierra Norte, Sierra Central, Sierra Sur	UNDP	5.22	1.20	6.42
Peru	Participatory Conservation and Sustainable Development Program with Indigenous Communities in Vilcabamba	Vilacamba Mountain Range	World Bank	0.75	0.42	1.17
Philippines	Sustainable Management of Mt. Isarog	Mount Isarog	UNDP	0.75	1.48	2.23
Romania	Integrated Protected Areas and Conservation Management	Carpathian Mountains	World Bank	5.33	1.60	6.93
Russian Federation	Strengthening Protected Areas Network for Sikhote-Alin Mountain Forest Ecosystems Conservation in Khabarovsky Kray	Sikhote-Alin Mts. Strelnikov Mts.	World Bank	0.75	1.00	1.75
Russian Federation	Biodiversity Conservation	Barguzin Mountain Range, North Uralmountains, Altai Mountains, Sikhote-Alin Mountain Range, Yabloncvyi Ridge, Burey Ridge	World Bank	20.90	5.90	26.80

GEF INVESTMENTS IN MOUNTAINS (FISCAL 1991–2002)* CONTINUED

COUNTRY	PROJECT NAME	MOUNTAIN RANGE/ MOUNTAINS	IMPLE-MENTING AGENCY	GEF (US$ MILLIONS)	COFINANC-ING (US$ MILLIONS)	TOTAL COST (US$ MILLIONS)
Russian Federation	Demonstrating Sustainable Conservation of Biological Diversity in Four Protected Areas in Russia's Kamchatka's Oblast, Phase I	Kamchatka	UNDP	2.36	2.78	5.14
Rwanda	Integrated Management of Critical Ecosystems	Great Rift Valley	World Bank	4.65	44.41	49.06
Slovak Republic	Central European Grasslands: Conservation and Sustainable Use	Levocske Mountains	World Bank	0.75	0.35	1.10
South Africa	Conservation of Globally Significant Biodiversity in Agricultural Landscapes through Conservation Farming	KwaZulu-Natal Drakensberg, Bokkevelt Plateau, Eastern Cape Mts., Nama Karoo	World Bank	0.75	0.97	1.72
South Africa	Conservation Planning for Biodiversity in the Thicket Biome	Eastern Cape Mts., Drakensberg	World Bank	0.74	0.12	0.86
Sri Lanka	Protected Area Management and Wildlife Conservation	Central Highlands	World Bank	10.20	24.50	34.70
Syria	Conservation of Biodiversity and Protected Areas Management	Jabal al Nusayriyah	World Bank	0.75	0.68	1.43
Tanzania	Conservation and Management of the Eastern Arc Mountain Forests	Ulugura Mts. Udzungwa Mts. East Usambara Mts.	World Bank/ UNDP	12.37	38.45	50.82
Turkey	Integrated Protected Areas and Conservation Management	Pontic Mts., Central Anatolian Plateau, Taurus Mts.	World Bank	8.55	2.00	10.55
Uganda	Protected Areas Management and Sustainable Use (PAMSU)	Mt.Elgon, Rwenzori Mts.	World Bank	8.00	30.00	38.00
Uganda	Bwindi Impenetrable National Park and Mgahinga Gorilla National Park Conservation	Rukiga Highlands, Virungas Volcanic Mountain Range	World Bank	4.43	2.31	6.74
Uganda	Kibale Forest Wild Coffee Project	Ruwenzori Mountain Range	World Bank	0.75	3.40	4.15
Ukraine	Transcarpathian Biodiversity Protection	Carpathian Mts.	World Bank	0.50	0.08	0.58
Vietnam	Vietnam PARC: Creating Protected Areas for Resources Conservation (PARC) in Vietnam Using a Landscape Ecology Approach		UNDP	6.04	0.66	6.70
Yemen	Protected Areas Management	Asir Mountain Range and Hadhramaut Mts.	World Bank	0.75	0.68	1.43
Zambia	Sustainable Land Management in the Zambian Miombo Woodland Ecosystem		World Bank	0.75	0.60	1.35
Zimbabwe	Conservation and Sustainable Use of Traditional Medicinal Plants	Inyanga Mts.	UNDP	1.00	0.63	1.63
			TOTAL	621.59	1,444.94	2,066.53

* This list includes only medium and large-size GEF projects categorized under GEF mountain ecosystem operational program (OP#4) and GEF projects whose area includes mountains, but are categorized under other operational programs, namely (OP#1,2, 3, 9,12, and 13).

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